

Amendment and Response
Applicant: Trudy L. Benjamin
Serial No.: 10/827,142
Filed: April 19, 2004
Docket No.: 200309559-1
Title: FLUID EJECTION DEVICE

IN THE CLAIMS

Please cancel claim 64 without prejudice.

Please amend claims 1, 3-9, 12, 13, 22-27, 29-34, 40-42, 44-56, 58-61, and 63 as follows:

1. (Currently Amended) A fluid ejection device comprising:
| a control line configured to receive a control signal;
firing cells including a first group of firing cells and a second group of firing cells;
and
| control circuitry configured to respond to a first pulse of the control signal to
selectively initiate a first sequence of address signals adapted to enable the first group of
firing cells for activation and to respond to a second pulse of the control signal to selectively
| initiate a second sequence of address signals adapted to enable the second group of firing
cells for activation.
2. (Original) The fluid ejection device of claim 1, wherein the control circuitry
comprises a first address generator and a second address generator.
3. (Currently Amended) The fluid ejection device of claim 2, wherein the first address
| generator is configured to respond to the first pulse of the control signal to initiate the first
sequence and the second address generator is configured to respond to the second pulse of the
| control signal to initiate the second sequence.
4. (Currently Amended) The fluid ejection device of claim 2, wherein the first address
| generator comprises first group circuitry configured to respond to the first pulse of the control
signal to initiate the first sequence and second group circuitry configured to respond to the
| second pulse of the control signal to initiate the second sequence.
5. (Currently Amended) The fluid ejection device of claim 1, wherein the control
| circuitry comprises a first address generator configured to respond to the first pulse of the

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control signal to initiate the first sequence and the second pulse of the control signal to initiate the second sequence.

6. (Currently Amended) The fluid ejection device of claim 5, wherein the firing cells further comprise a third group of firing cells and a fourth group of firing cells and the control circuitry further comprises a second address generator configured to respond to a third pulse of the control signal to selectively initiate a third sequence adapted to enable the third group of firing cells for activation and to respond to a fourth pulse of the control signal to selectively initiate a fourth sequence adapted to enable the fourth group of firing cells for activation.

7. (Currently Amended) The fluid ejection device of claim 1, comprising signal lines configured to receive a series of timing pulses, wherein the control circuitry is configured to respond to the series of timing pulses and the control signal to provide the first sequence and the second sequence.

8. (Currently Amended) The fluid ejection device of claim 7, wherein the control circuitry is configured to receive a first one group of timing pulses from the series of timing pulses to provide the first sequence and a second group of timing pulses from the series of timing pulses to provide the second sequence.

9. (Currently Amended) A fluid ejection device comprising:
firing cells including a first bank of firing cells and a second bank of firing cells; and
a first address generator configured to respond to control signals to selectively provide a first sequence of first address signals adapted to enable the first bank of firing cells for activation and a second sequence of second address signals adapted to enable the second bank of firing cells for activation, wherein the second sequence of second address signals is selectively provided independent of the first sequence of first address signals.

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10. (Original) The fluid ejection device of claim 9, wherein one of the control signals comprise control pulses and the first address generator is configured to respond to the control pulses to initiate the first sequence and to initiate the second sequence.

11. (Original) The fluid ejection device of claim 9, wherein the control signals comprise a series of timing pulses and the first address generator is configured to respond to the series of timing pulses to provide the first address signals and the second address signals.

12. (Currently Amended) The fluid ejection device of claim 9, wherein the control signals comprise control pulses and a series of timing pulses and the first address generator is configured to initiate the first sequence and to initiate the second sequence in response to receiving control pulses ~~substantially~~ substantially coincident with timing pulses in the series of timing pulses.

13. (Currently Amended) The fluid ejection device of claim 9, wherein the control signals comprise control pulses and a series of timing pulses and the first address generator is configured to initiate the first sequence in response to receiving a first control pulse in the control pulses substantially ~~substantially~~ coincident with a first timing pulse in the series of timing pulses.

14. (Original) The fluid ejection device of claim 13, wherein the first address generator is configured to initiate the second sequence in response to receiving a second control pulse in the control pulses substantially coincident with a second timing pulse in the series of timing pulses.

15. (Original) The fluid ejection device of claim 14, wherein the first timing pulse and the second timing pulse are different timing pulses in the series of timing pulses.

16. (Original) The fluid ejection device of claim 14, wherein the first address generator further comprises:

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a direction circuit configured to set a first direction signal in response to receiving a third control pulse in the control pulses substantially coincident with a third timing pulse in the series of timing pulses.

17. (Original) The fluid ejection device of claim 16, wherein the third timing pulse and the first timing pulse are different timing pulses in the series of timing pulse and the third timing pulse and the second timing pulse are different timing pulses in the series of timing pulses.

18. (Original) The fluid ejection device of claim 17, wherein the direction circuit receives a fourth timing pulse in the series of timing pulses and responds to the fourth timing pulse to set a second direction signal.

19. (Original) The fluid ejection device of claim 18, wherein the first timing pulse and the second timing pulse and the third timing pulse and the fourth timing pulse are different timing pulses in the series of timing pulses.

20. (Original) The fluid ejection device of claim 18, wherein the fourth timing pulse follows the third control pulse and the first timing pulse occurs at a different time than between the third control pulse and the fourth timing pulse.

21. (Original) The fluid ejection device of claim 18, wherein the fourth timing pulse follows the third control pulse and the first timing pulse and the second timing pulse occur at different times than between the third control pulse and the fourth timing pulse.

22. (Currently Amended) The fluid ejection device of claim 9, wherein the firing cells comprise a third bank of firing cells and a fourth bank of firing cells and the fluid ejection device further comprises:

a second address generator configured to respond to the control signals to selectively provide a third sequence of third address signals adapted to enable the third bank of firing cells for activation and a fourth sequence of fourth address signals adapted to enable the

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fourth bank of firing cells for activation, wherein the third sequence of third address signals is selectively provided independent of the fourth sequence of fourth address signals.

23. (Currently Amended) A fluid ejection device comprising:
firing cells including a first group of fluid ejection elements and a second group of fluid ejection elements;
an address generator including:

first bank circuitry configured to receive a first group of the timing pulses from a series of timing pulses and generate a first sequenceset of address signals in response to the first group of timing pulses, wherein the first sequenceset of address signals is adapted to enable the first group of fluid ejection elements; and

second bank circuitry configured to receive a second group of the timing pulses from the series of timing pulses and generate a second sequenceset of address signals in response to the second group of timing pulses, wherein the second sequenceset of address signals is adapted to enable the second group of fluid ejection elements.

24. (Currently Amended) The fluid ejection device of claim 23, wherein the first bank circuitry comprises:

a first shift register configured to provide first output signals.

25. (Currently Amended) The fluid ejection device of claim 24, wherein the second bank circuitry comprises:

a second shift register configured to provide second output signals.

26. (Currently Amended) The fluid ejection device of claim 25, wherein the first bank circuitry comprises a first logic circuit configured to provide the first sequenceset of address signals based on the first output signals and the second circuitry comprises a second logic circuit configured to provide the second sequenceset of address signals based on the second output signals.

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27. (Currently Amended) The fluid ejection device of claim 25, wherein the address generator comprises:

a direction circuit configured to receive a third group of ~~the~~ timing pulses from the series of timing pulses and provide direction signals in response to the third group of received timing pulses.

28. (Original) The fluid ejection device of claim 27, wherein the first shift register and the second shift register receive the direction signals and shift in a selected direction based on the direction signals.

29. (Currently Amended) The fluid ejection device of claim 24, wherein the first bank circuitry comprises:

a first logic circuit configured to provide the first sequenceset of address signals based on the first output signals.

30. (Currently Amended) The fluid ejection device of claim 23, wherein the first bank circuitry comprises:

a first logic circuit configured to provide the first sequenceset of address signals in response to the first group of received timing pulses.

31. (Currently Amended) The fluid ejection device of claim 23, wherein the address generator comprises:

a direction circuit configured to receive a third group of ~~the~~ timing pulses from the series of timing pulses and provide direction signals in response to the third group of received timing pulses.

32. (Currently Amended) The fluid ejection device of claim 31, wherein the first bank circuitry and the second bank circuitry receive the direction signals and provide the first sequenceset of address signals and the second sequenceset of address signals in selected sequences based on the direction signals.

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33. (Currently Amended) The fluid ejection device of claim 23, wherein the first bank circuitry is a first bank generator and the second bank circuitry is a second bank generator.

34. (Currently Amended) The fluid ejection device of claim 23, wherein the address generator is electrically coupled with both the first group of fluid ejection elements and the second group of fluid ejection elements, wherein the first bank circuitry is coupled to the first group of fluid ejection elements and not the second group of fluid ejection elements, and wherein the second bank circuitry is coupled to the first group of fluid ejection elements and not the second group of fluid ejection elements.

35. (Original) A fluid ejection device comprising:
firing cells including a first bank of firing cells and a second bank of firing cells;
a control line configured to receive a control signal; and
a first address control circuit configured to respond to the control signal to selectively initiate a first sequence of first address signals adapted to enable the first bank of firing cells for activation and a second sequence of second address signals adapted to enable the second bank of firing cells for activation.

36. (Original) The fluid ejection device of claim 35, wherein the firing cells comprise a third bank of firing cells and a fourth bank of firing cells and wherein the fluid ejection device comprises:
a second address control circuit configured to respond to the control signal to selectively initiate a third sequence of third address signals adapted to enable the third bank of firing cells for activation and a fourth sequence of fourth address signals adapted to enable the fourth bank of firing cells for activation.

37. (Original) The fluid ejection device of claim 36, wherein the firing cells are organized into fire groups of firing cells, wherein a first subset of the fire groups comprises the first bank of firing cells and the second bank of firing cells and a second subset of the fire groups comprises the third bank of firing cells and the fourth bank of firing cells.

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38. (Original) The fluid ejection device of claim 35, wherein the firing cells are organized into six fire groups of firing cells, wherein three of the six fire groups comprise the first bank of firing cells and the second bank of firing cells.

39. (Original) The fluid ejection device of claim 35, comprising signal lines configured to receive a series of timing pulses, wherein the first address control circuit is configured to receive a first group of the timing pulses from the series of timing pulses and generate the first sequence of first address signals in response to the received first group of timing pulses and to receive a second group of the timing pulses from the series of timing pulses and generate the second sequence of second address signals in response to the received second group of timing pulses.

40. (Currently Amended) A fluid ejection device comprising:
means for receiving a control signal;
a first plurality of means for ejecting fluid;
a second plurality of means for ejecting fluid; and
means for responding to ~~the~~ a control signal to selectively initiate a first sequence of
address signals for enabling the first plurality of means for ejecting fluid and a second
sequence of address signals for enabling the second plurality of means for ejecting fluid.

41. (Currently Amended) The fluid ejection device of claim 40, further comprising a third plurality of means for ejecting fluid and a fourth plurality of means for ejecting fluid, and wherein the means for responding further comprises second means for responding to the control signal to selectively initiate a third sequence of address signals for enabling the third plurality of means for ejecting fluid and a fourth sequence of address signals for enabling the fourth plurality of means for ejecting fluid.

42. (Currently Amended) The fluid ejection device of claim 40, ~~further comprising~~
wherein the means for responding comprises means for responding to a first ~~one~~ group of timing pulses from a series of timing pulses to provide the first sequence of address signals

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and is responsive to a second group of timing pulses from the series of timing pulses to provide the second sequence of address signals.

43. (Original) The fluid ejection device of claim 40, wherein the means for responding provides the second sequence of address signals independent of the first sequence of address signals.

44. (Currently Amended) The fluid ejection device of claim 40, wherein the means for responding comprises means for responding to a series of timing pulses ~~in the control signal~~ to provide the first sequence of address signals and the second sequence of address signals.

45. (Currently Amended) The fluid ejection device of claim 40, wherein the means for responding comprises means for responding to control pulses received substantially coincident with timing pulses in the series of timing pulses to initiate the first sequence of address signals and to initiate the second sequence of address signals.

46. (Currently Amended) The fluid ejection device of claim 40, wherein the means for responding comprises means for responding to a first control pulse received substantially coincident with a first timing pulse in the series of timing pulses to initiate the first sequence of address signals.

47. (Currently Amended) The fluid ejection device of claim 46, wherein the means for responding comprises means for responding to a second control pulse received substantially coincident with a second timing pulse in the series of timing pulses to initiate the second sequence of address signals.

48. (Currently Amended) A method for ejecting fluid from a fluid ejection device, the method comprising:

receiving a control signal;

initiating a first sequence of address signals adapted to enable a first group of firing cells in response to a first pulse of the control signal; and

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initiating a second sequence of address signals adapted to enable a second group of firing cells in response to a second pulse of the control signal.

49. (Currently Amended) The method of claim 48, further comprising:

initiating a third sequence of address signals adapted to enable a third group of firing cells in response to a third pulse of the control signal; and

initiating a fourth sequence of address signals adapted to enable a fourth group of firing cells in response to a fourth pulse of the control signal.

50. (Currently Amended) The method of claim 48, further comprising:

receiving a series of timing pulses;

responding to a first group of timing pulses from the series of timing pulses to provide the first sequence of address signals; and

responding to a second group of timing pulses from the series of timing pulses to provide the second sequence of address signals.

51. (Currently Amended) A method for ejecting fluid from a fluid ejection device, the method comprising:

receiving control signals;

selectively providing, in response to the control signals, a first sequence of first address signals adapted to enable a first bank of firing cells for activation; and

selectively providing, in response to the control signals, a second sequence of second address signals adapted to enable a second bank of firing cells for activation, wherein the second sequence of second address signals is selectively provided independent of the first sequence of first address signals.

52. (Currently Amended) The method of claim 51, wherein selectively providing comprises:

responding to control pulses in one of the control signals to initiate the first sequence of first address signals and to initiate the second sequence of second address signals.

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53. (Currently Amended) The method of claim 51, wherein selectively providing comprises:

responding to a series of timing pulses in the control signals to provide the first sequence of first address signals and the second sequence of second address signals.

54. (Currently Amended) The method of claim 51, wherein selectively providing comprises:

receiving control pulses in one of the control signals;
receiving a series of timing pulses in the control signals; and
responding to control pulses received substantially coincident with timing pulses in the series of timing pulses to initiate the first sequence of first address signals and to initiate the second sequence of second address signals.

55. (Currently Amended) The method of claim 51, wherein selectively providing comprises:

receiving control pulses in one of the control signals;
receiving a series of timing pulses in the control signals; and
responding to a first control pulse received substantially coincident with a first timing pulse in the series of timing pulses to initiate the first sequence of first address signals.

56. (Currently Amended) The method of claim 55, wherein selectively providing comprises:

responding to a second control pulse received substantially coincident with a second timing pulse in the series of timing pulses to initiate the second sequence of second address signals.

57. (Original) The method of claim 56, wherein selectively providing comprises:

responding to a third control pulse received substantially coincident with a third timing pulse in the series of timing pulses to set a direction signal.

58. (Currently Amended) A fluid ejection device comprising:

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firing cells including a first group of resistors and a second group of resistors;
an address generator electrically coupled to the first group of resistors and the second group of resistors, the address generator including:

first bank circuitry configured to receive a first group of the timing pulses and generate a first sequenceset of address signals in response to the first group of timing pulses, the first bank circuitry electrically connected to the first group of resistors and not the second group of resistors, wherein the first sequenceset of address signals is adapted to enable the first group of resistors to conduct; and

second bank circuitry configured to receive a second group of the timing pulses ~~from the series of timing pulses and~~ generate a second sequenceset of address signals in response to the second group of received timing pulses, the second bank circuitry electrically connected to the second group of resistors and not the first group of resistors, wherein the second sequenceset of address signals is adapted to enable the second group of resistors to conduct.

59. (Currently Amended) The fluid ejection device of claim 58, wherein the first bank circuitry comprises:

a first shift register configured to provide first output signals; and

a first logic circuit configured to provide the first sequenceset of address signals based on the first output signals.

60. (Currently Amended) The fluid ejection device of claim 59, wherein the second bank circuitry comprises:

a second shift register configured to provide second output signals; and

~~the second circuitry comprises~~ a second logic circuit configured to provide the second sequenceset of address signals based on the second output signals.

61. (Currently Amended) The fluid ejection device of claim 58, wherein the address generator comprises:

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a direction circuit configured to receive a third group of ~~the~~ timing pulses from the series of timing pulses and provide direction signals in response to the third group of received timing pulses.

62. (Original) The fluid ejection device of claim 61, wherein the first shift register and the second shift register receive the direction signals and shift in a selected direction based on the direction signals.

63. (Currently Amended) The fluid ejection device of claim 5823, wherein the first bank circuitry is a first bank generator and the second bank circuitry is a second bank generator.

64. (Cancelled).